



PATENT

***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE***

In re Application of:  
HAO-YUN MA et al.

Serial No.: 10/604,872

Confirmation No.: 1871

Filed: 08/22/2003

For: LAND GRIDD ARRAY SOCKET WITH  
REINFORCE PLATE

) Examiner:  
) NGUYEN, TRUC T

) Group Art Unit: 2833

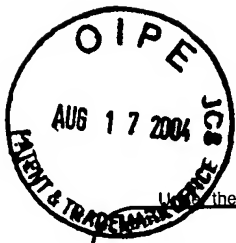
) Dated: Aug. 10, 2004

**VERIFICATION OF TRANSLATION**

I, Wei Te Chung, am a patent agent (Reg. No.: 43,325), hereby declare that I am well conversant in both the English and Chinese languages, and that the attached translation is a true translation of the Taiwan patent application 91220447 with the filing date of 12/17/2002 on which the priority was claimed, into the English language, to the best of my knowledge and belief.

Date: Aug 10, 2004

Signed: [Signature]



1FW

PTO/SB/21 (05-03)  
Approved for use through 04/30/2003. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>  <i>(to be used for all correspondence after initial filing)</i>	Application Number	10/604,872	
	Filing Date	08/22/03	
	First Named Inventor	Hao-Yun Ma	
	Art Unit	2833	
	Examiner Name	NGUYEN, TRUC T	
Total Number of Pages in This Submission	45	Attorney Docket Number	

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input checked="" type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <div>Remarks</div>	<input type="checkbox"/> After Allowance communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): <b>Verification of Translation, Translation</b>

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Wei Te Chung Foxconn International, Inc.
Signature	
Date	

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.	
Typed or printed name	Wei Te Chung
Signature	
Date	8/22/03

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



## **ABSTRACT**

An electrical connector for electrically connecting a land grid array (LGA) package to a printed circuit board (PCB) includes a housing with a number of contacts therein, a reinforcing plate mounted on the housing, and a driven member and a pressing plate attached to opposite ends of the housing. The pressing plate and the driven member are assembled on the housing to hold the LGA package on the housing. The driven member includes a driven section and an action part being connected to the driven section. The reinforcing plate has a baffle extended toward the housing. The action part of the driven member is received between the baffle of the reinforcing plate and a side wall of the housing, thereby avoiding escaping of the action part from the housing.

## **SPECIFICATION**

### **ELECTRICAL CONNECTOR**

#### **[FIELD OF THE INVENTION]**

**[0001]** The present invention relates to electrical connectors, and more particularly to an electrical connector having a reinforcing plate and being adapted to electrically connect a land grid array (LGA) package to a printed circuit board (PCB).

#### **[DESCRIPTION OF THE PRIOR ART]**

**[0002]** Referring to FIG. 1, an electrical connector 9 for electrically interconnecting an LGA package 8 with a PCB (not shown) comprises a housing 91 with a plurality of passageways (not shown) for receiving corresponding contacts (not shown) therein, and a holding assembly. The holding assembly conventionally comprises a driven member 92 and a pressing plate 93 attached to opposite ends of the housing 91. The pressing plate 93 has one end thereof attached to the housing 91, and is devised to have a frame-like configuration with a hole at a center thereof and sunken middle parts thereof able to abut against a surface of the housing 91. A sunken notch (not shown) is defined in the other end of the housing 91. The driven member 92 is assembled to the one end of the housing 91 opposite to the end on which the pressing plate 93 is assembled. After the pressing plate 93 holds the LGA package 8, the driven member 92 is rotated to make a part thereof fall in the sunken notch, thereby holding the pressing plate 93.

**[0003]** The driven member 92 is positioned by a protrusion 911 formed on the housing 91, thereby being prevented from escaping from the housing 91. The protrusion 911 is formed from plastic material and is easily worn out. As a result, after the connector 9 has been used for a long time, the protrusion 911 is prone to escape from the housing 91. The protrusion 911 formed on the housing 91 also renders the mould for manufacturing the housing 91 complex. Accordingly, the costs for the mould are increased.

**[0004]** The sunken middle parts of the pressing plate 93 are used to provide a downward force to assail the housing 91. Due to said assailing, an upward counteractive force is accordingly generated to act on the end of the housing 91 to which the pressing plate 93 is attached. Additionally, the driven member 92 also provides another downward force to press the pressing plate 93 in the notch. Because of said downwardly pressing, another upward counteractive force is correspondingly born to assail the end of the housing 91 to which the driven member 92 is attached.

**[0005]** As a result, the opposite ends of the housing 91 are assailed by the upward counteractive force and said another upward counteractive force and middle parts of the housing 91 are pressed downwardly by the middle sunken parts of the pressing plate 93. In order to assure reliable electrical connection between conductive members of the LGA package 8 and corresponding contacts, a relatively great holding force is needed to act on the LGA package 8. Said relatively great holding force is transmitted to assail on the housing 91 via the LGA package 8. Since the plurality of passageways is defined in the housing, 91 thereby decreasing rigidity of the housing 91 and the above forces are assailed on the housing 91 at the same time, the housing 91 is liable to be bent at the opposite

ends thereof. Consequently, gaps are prone to be formed between the conductive members of the LGA package 8 and the corresponding contacts which are located at the opposite ends of the housing 91 and electrical engagement therebetween is liable to be lost.

### **[SUMMARY OF THE PRESENT INVENTION]**

**[0006]** An object of the present invention is to provide an electrical connector, and more particularly an electrical connector with a reinforcing mechanism.

**[0007]** The electrical connector of the present invention for electrically an LGA package to a PCB comprises a housing having a plurality of contacts arranged thereon, a reinforcing plate assembled on the housing and an driven member a pressing plate attached to two opposite ends of the housing. The driven member and the pressing plate are assembled on the housing and able to hold the LGA package on the housing. The driven member comprises a driven section and an action part being connected to the driven section.

**[0008]** Compared with the prior art, the present invention has the following advantages: the reinforcing plate assembled on the housing increases rigidity of the housing, thereby avoiding warpage deformation of the housing due to pressing forces which are generated when the pressing plate holds the LGA package, and then indirectly assailed on the housing. Additionally, the pressing pate has a baffle extended toward the housing, thereby stably positioning the driven member.

### **[DETAILED DESCRIPTION OF THE EMBODIMENT]**

**[0009]** Referring to FIGS. 2, 3 and 4, an electrical connector 1 of the present

invention is adapted to electrically connect an LGA package (not shown) with a PCB (not shown) and comprises a housing 11 having a plurality of conductive contacts (not shown) arranged therein, a reinforcing plate 12 assembled on the housing 11 and a pressing plate 14 and a driven member 15 respectively attached to opposite ends of the housing 11.

**[0010]** The housing 11 has a longitudinal plate-like configuration with a electric section 111 at a center thereof. A plurality of passageways (not shown) is defined in the electric section 111, the passageways receiving corresponding contacts (not shown). The housing 11 comprises transverse front and rear side walls 112, 113, and longitudinal left and right side walls 114, 115.

**[0011]** A trapezium-like action cavity 1121 is defined through the housing 11 at the end adjacent the front side wall 112. A pair of supporting braces 1122 extends from bottoms of opposite ends of the front side wall 112.

**[0012]** Two first receiving recesses 1135 are symmetrically defined in the rear side wall 113. A notch 1133 is defined at a middle of the rear side wall 113. The housing 11 is configured with an arc-like positioning surface 1134 at the notch 1133. Two positioning recesses 1131 are defined in the housing, parallel to the two first receiving recesses 1135. Arc-like holding surfaces (not shown) are formed on the housing 11, extending from the positioning recesses 1131 toward the rear side wall 113.

**[0013]** A crescent-like locking part 1142 projects out from left side wall 114 of the housing 11. A plurality of elongated second receiving recesses 1141 is uniformly defined respectively in the left and right side walls 114, 115 of the

housing 11.

**[0014]** The contacts received in the housing 11 are soldered on the PCB, thereby achieving electrical connection therebetween. A surface formed on the housing 11 opposite to the PCB is used to facilitate nesting the LAG package. The contacts are also used to engage with the LAG package, thereby establishing electrical engagement between the PCB and the LAG package.

**[0015]** The reinforcing plate 12 is formed from rigid material. In the present preferred embodiment, the reinforce plate 12 has a frame-like configuration with a hole in a center thereof. Two first bent tabs 121 extend perpendicularly from transverse sides of the reinforcing plate 12 toward the housing 11, corresponding to the two first receiving recesses 1135 of the housing 11. A plurality of second bent tabs 122 perpendicularly extends from longitudinal sides of the reinforcing plate 12 toward the housing 11, corresponding to the second receiving recesses 1141. A baffle 124 depends from the side of the reinforcing plate 12 which is opposite to the side on which the first bent tabs 121 are formed. Additionally, two sidewalls 125 depend perpendicularly from the two opposite transverse sides toward the housing 11, respectively. A gap 126 is defined in the reinforcing plate 12, corresponding to the notch 1133 of the housing 11.

**[0016]** When the reinforcing plate 12 is assembled on the housing 11, the two first bent tabs 121 of the reinforcing plate 12 are respectively positioned in the two first receiving recesses 1135 of the housing 11. The second bent tabs 122 of the reinforcing plate 12 are interveniently positioned in the second receiving recesses 1141 of the housing 11. The sidewalls 125 of the reinforcing plate 12 are placed to abut against the left and right side walls 114, 115, respectively. The baffle 124



of the reinforcing plate 12 is positioned between the braces 1122 of the housing 11, and spaced a predetermined gap from the housing 11. The gap 126 of the reinforcing plate 12 is located by the positioning surface 1134, corresponding to the notch 1133 of the housing 11. The pressing plate 14 has a frame-like configuration with a hole at a center thereof, and two opposite sides each having a part thereof protruded toward the housing 11 to form pressing portions 141. A curved mating portion 142 extends from a side of the pressing plate 14. A mating end 143 is formed at a free end of the mating portion 142, with a mating surface 144 thereon. A pair of curved mounting portions 145 extends from a side of the pressing plate opposite to the side on which the mating portion is formed. A curved securing portion 146 extends from the side of the pressing plate 14 between the pair of curved mounting portions 145, with a one-fourth circle transverse cross section.

**[0017]** When the pressing plate 14 is assembly on the housing 11, the mounting portions 145 are respectively positioned in the positioning recesses 1131 and mate with the holding surfaces (not shown). The securing portion 146 of the pressing plate 14 engages with the positioning surface 1134.

**[0018]** The driven member 15 has a lever-like configuration and comprises a driven section 151 and an action part 152 vertical to each other. A locking section 153 is formed on the action part 152 at the side of the action part 152 at which the driven section 151 is located.

**[0019]** The action part 152 of the driven member 15 is placed on the braces 1122 of the housing 11 and in a space defined between the first bent tabs 121 of the reinforcing plate 12 and the front side wall 112 of the housing 11, thereby avoiding

escaping of the action part 152 from the braces 1122. Additionally, the driven member 15 can be positioned by the first bent tabs 121, thereby making position of the driven member 15 stable.

**[0020]** The LGA package is mounted on the housing 11. the pressing plate 14 is rotated to hold the LGA package, the pressing portions thereof 141 abutting against on a top surface of the LGA. The mating end 143 of the pressing plate 14 is located in the action cavity 1121 of the housing 11. The driven member 15 is rotated to provide a pressing force to make the locking section 153 thereof abut against the mating surface 144 of the pressing plate 14. Meanwhile, the pressing portions 141 of the pressing plate 14 is urged to press the LGA package, thereby establishing stable electrical engagement between the contacts and corresponding conductive members of the LGA package. The driven section 151 ultimately engages with the locking part 1142 of the housing 11. Thus, the LAG package is stably assembled on the housing 11.

**[0021]** The locking section 153 of the driven member 15 abuts against the mating surface 144 of the pressing plate 14. A counteractive force due to said abutting makes the driven section 151 of the driven member 15 press against top surfaces of the braces 1122 of the housing 11. The pressing portions 141 of the pressing plate 14 directly presses the LGA package and indirectly presses the housing 11. The mounting portions 145 of the pressing plate 14 press the holding surfaces of the housing 11 in the positioning recesses 1131. With this arrangement, the housing 11 is pressed downwardly at a middle thereof and opposite ends of the housing 11 are pulled upwardly. The reinforcing plate 12 is assembled on the housing 11, thereby increasing rigidness of the housing. Additionally, the reinforcing plate 12 is arranged around the housing 11. This

arrangement manner also increases the rigidness of the housing 11 again. Consequently, the enhanced rigidness keeps the housing 11 from warping or bending.

**[0022]** In view of the above, the present invention is actually defined to meet the patentable requirements of the utility patent, so a utility patent application for the invention is applied. However, the above description is only a preferred embodiment of the present invention. Any equivalent modification or change to the preferred embodiment by those skilled in the art in light of the spirit of the present invention does still fall in the scopes of the present invention as claimed below.

## **[EXPLANATION OF DRAWINGS]**

FIG. 1 is an isometric view of a conventional electrical connector concerning the present invention;

FIG. 2 is an exposed, isometric view of an electrical connector according to the present invention;

FIG. 3 is an assembled, isometric view of the electrical connector according to the present invention; and

FIG. 4 is an assembled, isometric view of the electrical connector according to the present invention, showing that a pressing plate of the electrical connector holds an LGA package.

## **[EXPLANATION OF REFERENCE NUMBERS]**

electrical connector	1	housing	11
electric section	111	front side wall	112
action cavity	1121	brace	1122
rear side wall	113	positioning recess	1131
notch	1133	positioning surface	1134
first receiving recess	1135	left side wall	114
second receiving recess	1141	locking part	1142
right side wall	115	reinforcing plate	12
first bent tab	121	second bent tab	122
baffle	124	sidewall	125
gap	126	pressing plate	14
pressing portion	141	mating portion	142
mating end	143	mating surface	144

mounting portion	145	securing portion	146
driven member	15	driven section	151
action part	152	locking section	153

## [CLAIMS]

1. An electrical connector for electrically interconnecting an LGA package with a PCB comprising:

a housing having a plurality of contacts received therein;

a pressing plate and a driven member being assembled on the housing for holding the LGA package;

a reinforcing plate being mounted on the housing; wherein

the driven member comprises a driven section and an action part being connected with the driven section, the reinforcing has a baffle at one end thereof extended toward the housing, the action part is received between the baffle and a side wall of the housing, thereby avoiding escaping of the action part from the housing.

2. The electrical connector as claimed in claim 1, wherein the housing has an electric section and defined receiving recesses around the electric section, the reinforcing plate has bent tabs corresponding to the receiving recesses.

3. The electrical connector as claimed in claim 2, wherein the housing has sides comprising transverse front and rear side walls and longitudinal left and right side walls, the front side wall forming two braces at opposite ends thereof.

4. The electrical connector as claimed in claim 3, wherein the housing defines an action cavity in one end thereof, the action cavity extending through the housing.

5. The electrical connector as claimed in claim 4, wherein the pressing plate has a frame-like configuration with a hole at a center thereof.

6. The electrical connector as claimed in claim 5, wherein the housing symmetrically defines positioning recesses in the other end thereof, a notch in a middle of the rear side wall which is located adjacent the positioning recesses, the pressing plate has mounting portions corresponding to the positioning recesses of the housing, and a securing portion corresponding to the notch.

7. The electrical connector as claimed in claim 6, therein the pressing plate forms a curved mating portion at one end thereof, the mating portion being received in the action cavity.

8. The electrical connector as claimed in claim 7, wherein the mounting portions of the pressing plate are positioned in the positioning recesses of the housing and the securing portion of the pressing plate is positioned in the notch of the housing.

9. The electrical connector as claimed in claim 8, wherein the pressing plate has parts at middles of opposite sides thereof projected toward the housing to form pressing portions.

10. The electrical connector as claimed in claim 9, wherein the driven member has a locking section offset from the driven section, the locking section being adapted to abut against the mating portion of the pressing plate.

11. The electrical connector as claimed in claim 10, wherein the baffle of the pressing plate is positioned between the two braces of the housing and spaced a gap from the housing, the driven member is positioned on the two braces.

12. The electrical connector as claimed in claim 11, the reinforcing plate is formed

from metal material.

13. An electrical connector for electrically interconnecting an LGA package with a PCB comprising:

a housing defining an electric section with a plurality of contacts received therein and receiving recesses around the electric section;

a pressing plate and a driven member being assembled on the housing for holding the LGA package;

a reinforcing plate being assembled on the housing; wherein

the driven member comprises a driven section and an action part being connected with the driven section, the reinforcing has a frame-like configuration with a hole at a center thereof, and forms a plurality of tabs corresponding to the receiving recesses of the housing, the reinforcing plate has a baffle at one end thereof extended toward the housing, the action part can be received between the baffle and a side wall of the housing, thereby avoiding escaping of the action part from the housing.

14. The electrical connector as claimed in claim 13, wherein the housing has sides comprising transverse front and rear side walls and longitudinal left and right side walls, the front side wall forming two braces at opposite ends thereof.

15. The electrical connector as claimed in claim 14, wherein the housing defines an action cavity in one end thereof, the action cavity extending through the housing.

16. The electrical connector as claimed in claim 15, wherein the pressing plate has a frame-like configuration with a hole at a center thereof.



17. The electrical connector as claimed in claim 16, wherein the housing symmetrically defines positioning recesses in the other end thereof, a notch in a middle of the rear side wall which is located adjacent the positioning recesses, the pressing plate has mounting portions corresponding to the positioning recesses of the housing, and a securing portion corresponding to the notch.

18. The electrical connector as claimed in claim 17, therein the pressing plate forms a curved mating portion at one end thereof, the mating portion being received in the action cavity.

19. The electrical connector as claimed in claim 18, wherein the mounting portions of the pressing plate are positioned in the positioning recesses of the housing and the securing portion of the pressing plate is positioned in the notch of the housing.

20. The electrical connector as claimed in claim 19, wherein the pressing plate has parts at middles of opposite sides thereof projected toward the housing to form pressing portions.

21. The electrical connector as claimed in claim 20, wherein the driven member has a locking section offset from the driven section, the locking section being adapted to abut against the mating portion of the pressing plate.

22. The electrical connector as claimed in claim 21, wherein the baffle of the pressing plate is positioned between the two braces of the housing and spaced a gap from the housing, the driven member is positioned on the two braces.

23. The electrical connector as claimed in claim 22, the reinforcing plate is formed

from metal material.

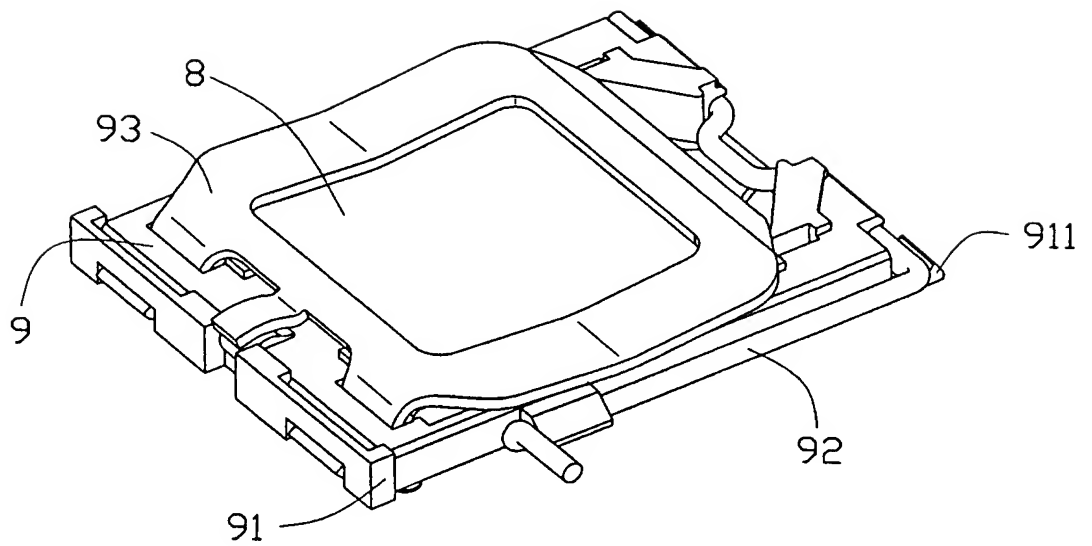


FIG. 1

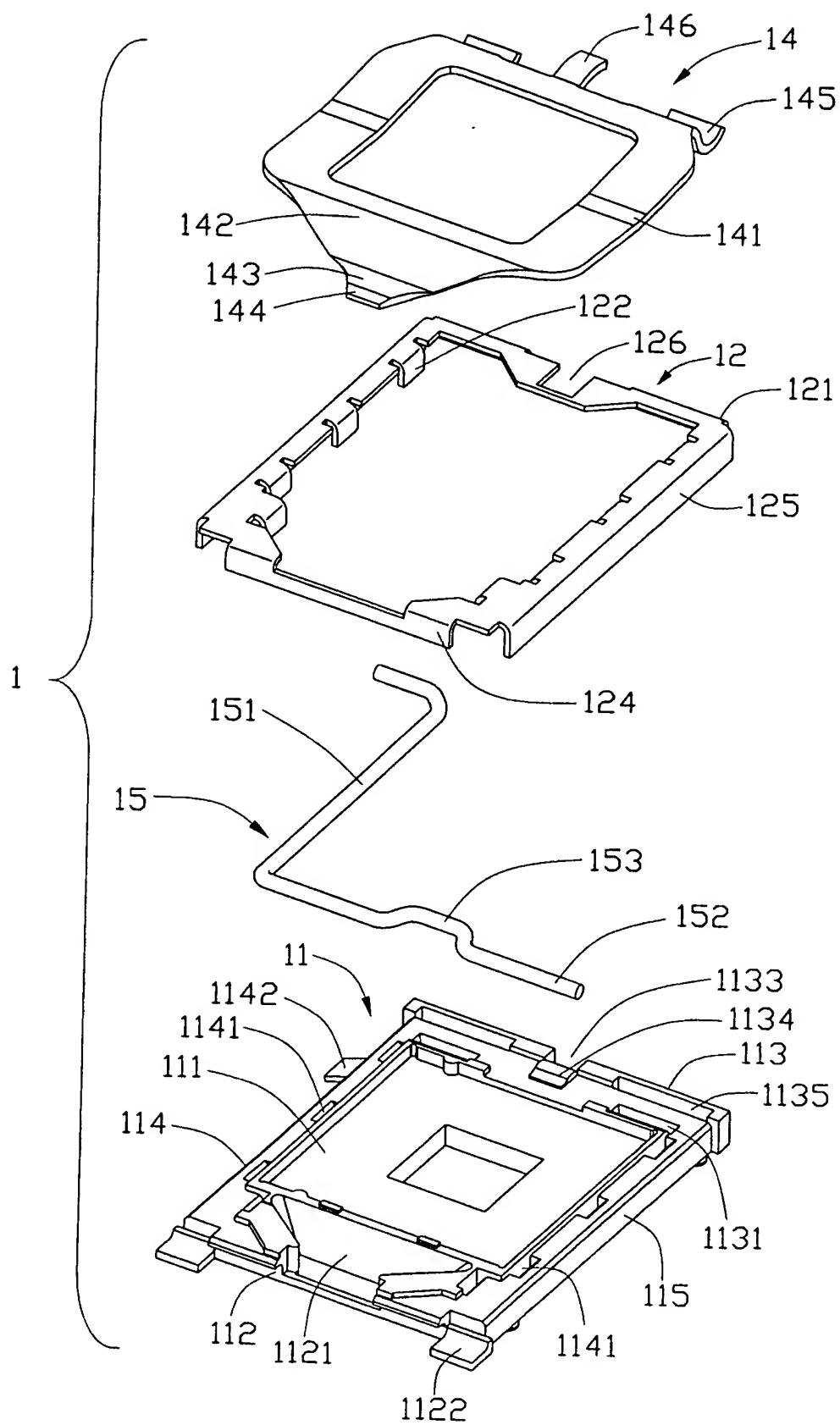


FIG. 2

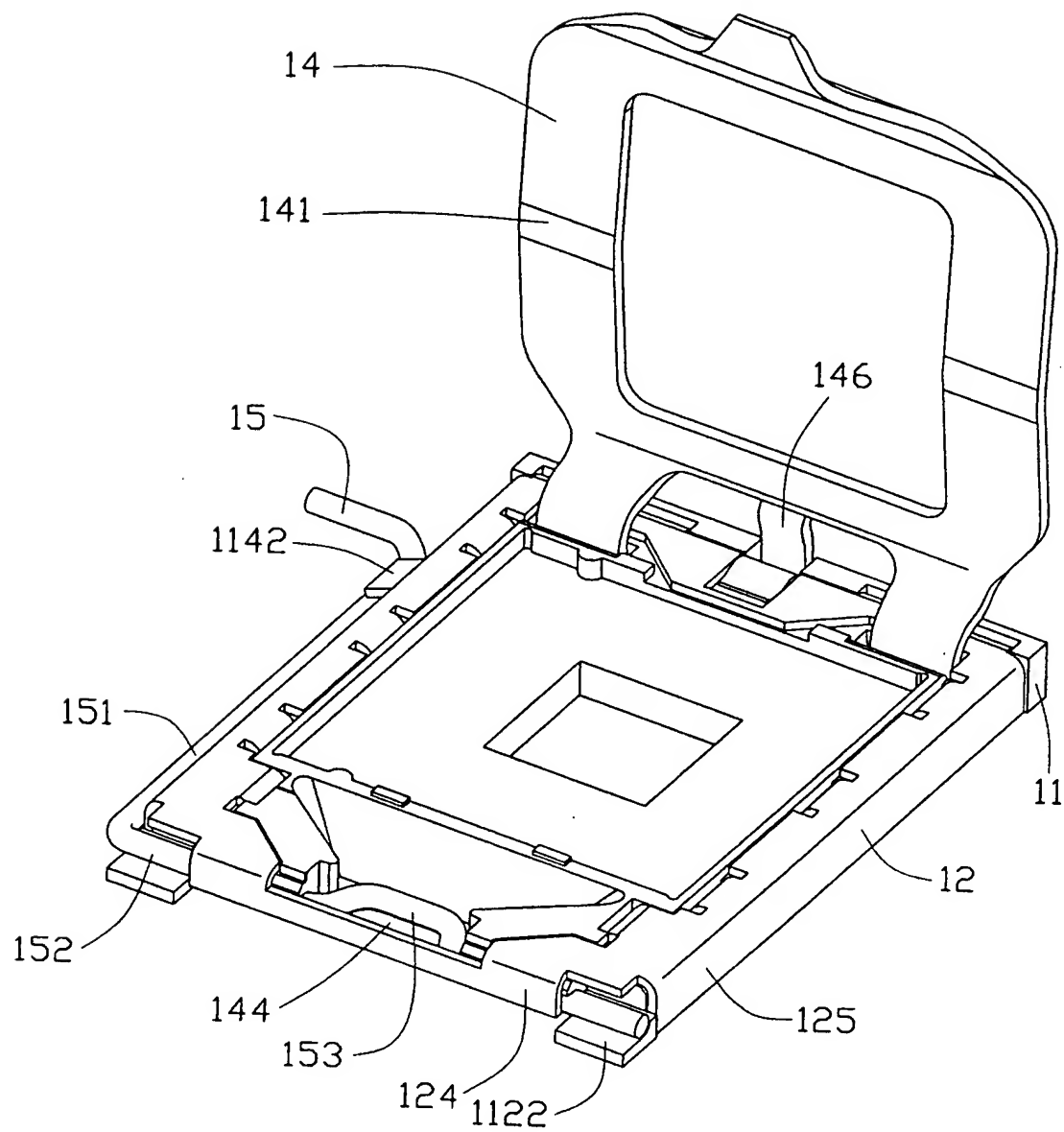


FIG. 3

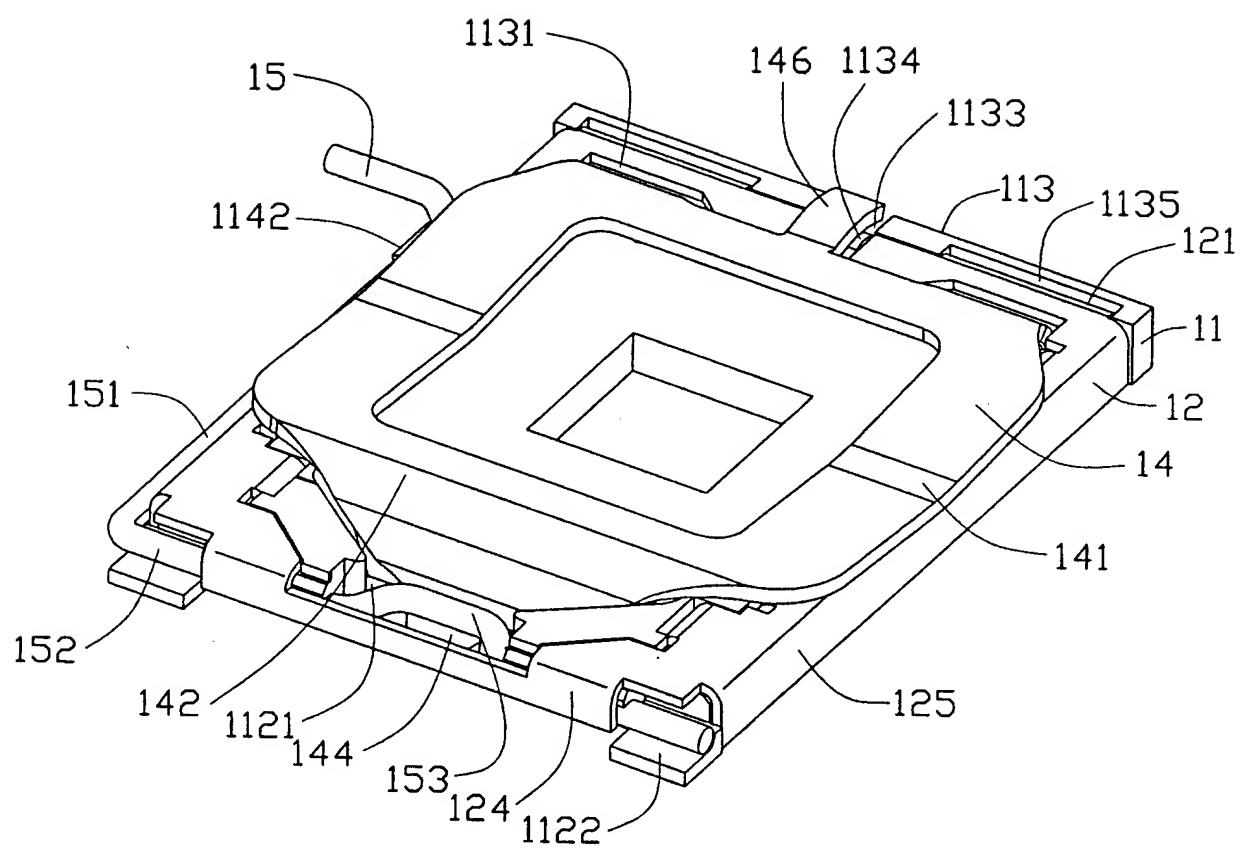


FIG. 4

BEST AVAILABLE COPY



中華民國經濟部智慧財產局

INTELLECTUAL PROPERTY OFFICE  
MINISTRY OF ECONOMIC AFFAIRS  
REPUBLIC OF CHINA

茲證明所附文件，係本局存檔中原申請案的副本，正確無訛，  
其申請資料如下：

This is to certify that annexed is a true copy from the records of this  
office of the application as originally filed which is identified hereunder.

申請日：西元 2002 年 12 月 17 日  
Application Date

申請案號：091220447  
Application No.

申請人：鴻海精密工業股份有限公司  
Applicant(s)

BEST AVAILABLE COPY

局長  
Director General

CERTIFIED COPY OF  
PRIORITY DOCUMENT

蔡練生

發文日期：西元 2003 年 1 月  
Issue Date

發文字號：09220023200  
Serial No.

申請日期：91.12.17

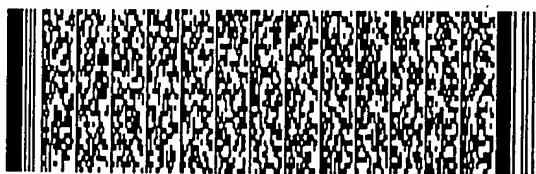
案號：91220447

類別：

(以上各欄由本局填註)

## 新型專利說明書

一、 新型名稱	中文	電連接器
	英文	Electrical Connector
二、 創作人	姓名 (中文)	1. 馬浩雲
	姓名 (英文)	1. Ma, Hao-Yun
	國籍	1. 中華民國 ROC
	住、居所	1. 台北縣土城市自由街2號(2, Tzu Yu Street, Tu-Cheng City, Taipei Hsien, Taiwan, ROC)
三、 申請人	姓名 (名稱) (中文)	1. 鴻海精密工業股份有限公司
	姓名 (名稱) (英文)	1. HON HAI PRECISION INDUSTRY CO., LTD.
	國籍	1. 中華民國 ROC
	住、居所 (事務所)	1. 台北縣土城市自由街2號(2, Tzu Yu Street, Tu-Cheng City, Taipei Hsien, Taiwan, ROC)
	代表人 姓名 (中文)	1. 郭台銘
	代表人 姓名 (英文)	1. Gou, Tai-Ming





四、中文創作摘要 (創作之名稱：電連接器)

一種將平面柵格陣列封裝電性連接至電路板的電連接器，其主要包括容置有複數導電端子之連接器本體、扣持於連接器本體之加強片及分別組接於連接器本體兩相對端之壓板及撥動件。壓板及撥動件係組接於連接器本體，且可將平面柵格封裝固持於連接器本體。撥動件包括驅動部及與其相連設置之作動部，加強片向連接器本體延設有擋板，撥動件之作動部係可容置於擋板與連接器本體一側壁間而防止作動部脫離連接器本體。

【本案指定代表圖及說明】

(一)、本案指定代表圖為：第二圖

(二)、本代表圖之元件代表符號簡單說明：

電連接器

1

連接器本體

11

英文創作摘要 (創作之名稱：Electrical Connector)

An electrical connector comprises an insulative housing, a reinforce plate, a lever and a clip. The lever and the clip are mounted on the insulative housing and can be installed a land grid-array clip. The reinforce plate defines a block piece. The block piece can prevent the lever from sliding out of the housing. The reinforce plate is mounted on one surface of the insulative housing to improve the rigidity of the housing and avoid warpage when the lever and the

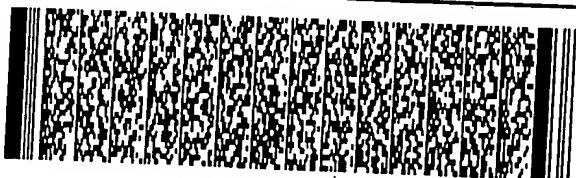


四、中文創作摘要 (創作之名稱：電連接器)

導電區	111	前壁	112
作動腔	1121	支撐塊	1122
後壁	113	定位槽	1131
缺口	1133	定位面	1134
第一容置槽	1135	左壁	114
容置槽	1141	鎖緊部	1142
右壁	115	加強片	12
第一折片	121	第二折片	122
擋板	124	擋壁	125
凹口	126	壓板	14
夾持部	141	配合部	142
配合端	143	配合面	144

英文創作摘要 (創作之名稱：Electrical Connector)

clip press the land grid array clip.



四、中文創作摘要 (創作之名稱：電連接器)

扣持部	145	定位部	146
撥動件	15	驅動部	151
作動部	152	鎖固部	153

英文創作摘要 (創作之名稱：Electrical Connector)



本案已向

國(地區)申請專利

申請日期

案號

主張優先權

無

## 五、創作說明 (1)

### 【 新型所屬之技術領域 】

本創作係一種電連接器，尤指一種設置有加強片、並用以將平面柵格陣列封裝電性連接至電路板之電連接器。

### 【 先前技術 】

如第一圖所示，將平面柵格陣列封裝8電性連接至電路板(未圖示)之電連接器9係包括開設有複數端子孔(未圖示)並於端子孔內容設有複數導電端子(未圖示)之連接器本體91及固持組件。固持組件係一般包括組接於連接器本體91兩相對端之撥動件92及壓板93。該壓板93係一端組接於連接器本體91一端，係為中空框架構造，中部下凹並可抵接於連接器本體91表面，其遠離組接端之另一端設有凹溝。撥動件92係組接於連接器本體91之與壓板93相對之另一端，壓板93扣持於平面柵格陣列封裝8後，轉動撥動件92以使其部分滑入壓板93之凹溝(未圖示)，從而將壓板93固定。

撥動件92係藉連接器本體91所凸設之凸塊911進行定位而不會脫離連接器本體91，該凸塊911係為塑膠材質故撥動件92旋轉時易被磨損，使用較長時間後撥動件92易脫落。且該連接器本體91設有該凸塊911後，會增加其模具製造難度，從而增加產品開發製造成本。

壓板93下凹之中部係對連接器本體91施加一向下作用力以將平面柵格陣列封裝8固持，是以，壓板93於與連接器本體91組接之一端對連接器本體91施加一向上反作用力，撥動件92因需對壓板93之凹溝施加向下作用力，故亦會

## 五、創作說明 (2)

對連接器本體91施加一向上反作用力。連接器本體91兩端受向上作用力，中部受向下作用力，且為保證平面柵格陣列封裝8之導電體與電連接器9之導電端子間穩固電性連接，需於平面柵格陣列封裝8上施加較大夾持力，該夾持力間接作用於連接器本體91之作用力亦較大。連接器本體91因已開設複數端子容置孔以容置導電端子，故其剛度較小，施加夾持力後其兩端會向遠離電路板之方向翹起，從而導致靠近兩端之平面柵格陣列封裝8之導電體與電連接器1之導電端子間產生空隙，無法實現電性導接。

### 【 新 型 內 容 】

本創作之目的在於提供一種電連接器，尤指一種具有較佳結構強度之電連接器。

本創作之一種將平面柵格陣列封裝電性連接至電路板的電連接器，其主要包括容置有複數導電端子之連接器本體、組接於連接器本體之加強片及分別組接於連接器本體兩相對端之壓板及撥動件。壓板及撥動件係組接於連接器本體，且可將平面柵格封裝固持於連接器本體。撥動件包括驅動部及與其相連設置之作動部。

與先前技術相比，本創作具有如下優點：連接器本體組接有加強片後可大大增加其剛度，以抵抗由於壓板在夾持過程中對連接器本體所施加之擠壓力，避免連接器本體發生翹曲變形。又，加強片向連接器本體延設有擋板，撥動件係藉該擋板進行定位，是以固持穩固。

### 【 實 施 方 式 】

#### 五、創作說明 (3)

請一併參閱第二圖、第三圖及第四圖，本創作係用於將平面柵格陣列封裝(未圖示)與電路板電性連接的電連接器1，其主要由容置有複數導電端子(未圖示)之連接器本體11、扣持於連接器本體11之加強片12，及分別組接於連接器本體11兩相對端之壓板14及撥動件15。

連接器本體11係呈縱長形平板狀構造，其中部設有導電區111，於導電區111開設有複數端子收容槽(未圖示)，該端子收容槽(未圖示)內收容有複數導電端子(未圖示)。連接器本體11之側壁分為橫向之前壁112、後壁113，及縱向之左壁114、右壁115。

連接器本體11之靠近前壁112之一端開設有梯形作動腔1121，該作動腔1121係貫穿連接器本體11，且於前壁112兩端之底部延設有兩支撐塊1122。

連接器本體11靠近後壁113之一端對稱開設有兩第一容置槽1135，於後壁113之中部開設有缺口1133，於該缺口1133形成有弧形定位面1134。與兩第一容置槽1135平行開設有兩定位槽1131，自該定位槽1131靠近後壁113之一側向後壁113方向延設有弧形固持面(未圖示)。

連接器本體11之左壁114凸設有月牙狀鎖緊部1142。連接器本體11靠近左壁114及右壁115之側邊均勻排佈有複數長形第二容置槽1141。

連接器本體11係藉導電端子(未圖示)焊接於電路板(未圖示)而與電路板(未圖示)實現機械及電性連接，連接器本體11於遠離電路板(未圖示)之表面係承載平面柵格陣

#### 五、創作說明 (4)

列封裝(未圖示)，藉導電端子(未圖示)與平面柵格陣列封裝(未圖示)之導電體之電性導接而最終實現平面柵格陣列封裝(未圖示)與電路板(未圖示)之電性導接。

加強片12係為強度較高之材質，在本實施方式中為金屬材質，其呈長形中空框體構造，其橫向側壁於連接器本體11兩第一容置槽1135之相應位置向連接器本體11方向豎直延伸有兩第一折片121，並縱向於連接器本體11第二容置槽1141之相應位置向連接器本體11方向豎直延伸有複數第二折片122。於加強片12與第一折片121相對之一側邊向連接器本體11方向豎直延伸有擋板124，另外兩相對側壁向連接器本體11方向豎直延伸有兩擋壁125。加強片12於連接器本體11之缺口1133之相應位置開設有凹口126。

加強片12組接於連接器本體11時，加強片12之兩第一折片121係分別定位於連接器本體11之兩第一容置槽1135，加強片12之複數第二折片122亦分別干涉定位於連接器本體11之複數第二容置槽1141，加強片12之兩擋壁125係分別貼置於連結器本體11之左壁114及右壁115。加強片12之擋板124係定位於連接器本體11兩支撐塊1122之間，且其與連接器本體11間形成一間隙。加強片12之凹口126係定位於連接器本體11缺口1133及其所形成之定位面1134。壓板14係為一中空框體構造，其兩相對側邊於中部向連接器本體11方向鼓起，形成夾持部141。另外一側邊沿弧線彎曲延伸有配合部142，該配合部142之自由末端形成有大致為平板狀之配合端143，配合端形成有配合面144。壓板



##### 五、創作說明 (5)

14 於與配合部142相對之另一側邊對稱延設有兩橫截面呈半圓弧狀之扣持部145，於兩口持部144之間延設有橫截面大致呈1/4圓弧狀之定位部146。

壓板14組接於連接器本體11上時，其扣持部145係定位於連接器本體11之定位槽1131，並扣持於定位槽1131之固持面(未圖示)。壓板14之定位部146係扣持於連接器本體11定位槽1131之定位面1134。

撥動件15係為一桿狀構造，包括互相垂直之驅動部151及作動部152，其中作動部152設有向驅動部151一側彎折鼓出之鎖固部153。

撥動件15之作動部152係放置於連接器本體11之兩支撐塊1122上，其作動部152容置於加強片12之擋板121與連接器本體11之前壁112形成之間隙內，而防止作動部152脫離連接器本體11之兩支撐塊1122。撥動件15可藉該金屬加強片12設置之擋板121進行定位，是以固持穩固。

當將平面柵格陣列封裝(未圖示)放置於連接器本體11上後，壓板14旋轉後扣持於平面柵格陣列封裝(未圖示)上，壓板14之夾持部141抵接於平面柵格陣列封裝(未圖示)之表面，壓板14配合部142之配合端143係容置於連接器本體11之作動腔1121。然後旋轉撥動件15使其驅動部151之鎖固部153抵接於壓板14配合部142之配合面144並於該配合面144施加一定壓力，同時壓板14之夾持部141亦擠壓平面柵格陣列封裝(未圖示)以使得平面柵格陣列封裝(未圖示)之導電體與連接器本體11導電區111之導電端子

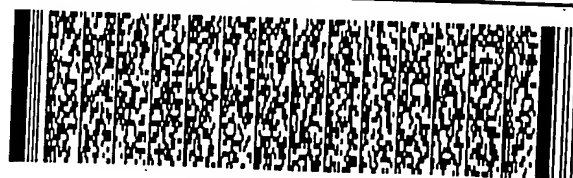
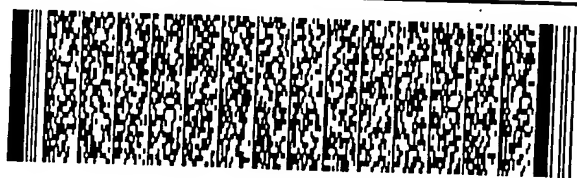


#### 五、創作說明 (6)

(未圖示)實現穩固電性導接，撥動件15之驅動部151最後定位於連接器本體11之鎖緊部1142。如是，平面柵格陣列封裝(未圖示)係穩固組接於連接器本體11。

撥動件15驅動部151之鎖固部153抵接於壓板14配合部142之配合面144並於該配合面144施加壓力時，其反作用力使得撥動件15之驅動部151擠壓連接器本體11收容空間1122之上頂面，壓板14之夾持部141擠壓平面柵格陣列封裝並間接擠壓連接器本體11，壓板14之扣持部145擠壓連接器本體11定位槽1131之固持面(未圖示)。如是，連接器本體11係中部受向下之擠壓力，兩端受向上之擠壓力，加強片12之剛度係大大高於連接器本體11之剛度，並貼置於連接器本體11表面之周圍邊緣，故可大大增加連接器本體11之剛度，從而可避免連接器本體11發生翹曲變形。

綜合上述，本創作確已符合新型專利之要件，爰依法提出專利申請。惟，以上所述僅為本創作之較佳實施例，舉凡熟悉本創作技藝之人士援依本創作之精神所作之等效修飾或變化，皆應涵蓋在以下申請專利範圍內。



# 圖式簡單說明

## 【圖示說明】

第一圖係與本創作相關之習知電連接器之立體圖。

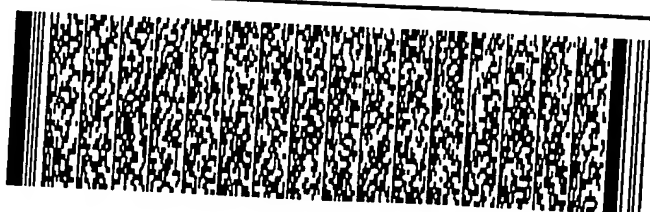
第二圖係本創作電連接器之立體分解圖。

第三圖係本創作電連接器之立體組合圖。

第四圖係本創作電連接器之壓板固持平面柵格陣列封裝時之立體組合圖。

## 【元件符號說明】

電連接器	1	連接器本體	11
導電區	111	前壁	112
作動腔	1121	支撐塊	1122
後壁	113	定位槽	1131
缺口	1133	定位面	1134
第一容置槽	1135	左壁	114
第二容置槽	1141	鎖緊部	1142
右壁	115	加強片	12
第一折片	121	第二折片	122
擋板	124	擋壁	125
凹口	126	壓板	14
夾持部	141	配合部	142
配合端	143	配合面	144
扣持部	145	定位部	146
撥動件	15	驅動部	151
作動部	152	鎖固部	153



## 六、申請專利範圍

1. 一種用於將平面柵格陣列封裝與電路板電性連接的電連接器，其包括：  
連接器本體，係容置有複數導電端子；  
壓板及撥動件，係組接於連接器本體以固持平面柵格陣列封裝；  
加強片，係組接於連接器本體上；其中  
撥動件包括驅動部及與其相連設置之作動部，加強片一端向連接器本體延設有擋板，撥動件之作動部係可容置於擋板與連接器本體側壁間而防止作動部脫離連接器本體。
2. 如申請專利範圍第1項所述之電連接器，其中連接器本體設有導電區，導電區周圍凹設有複數容置槽，加強片對應該容置槽彎折設有複數折片。
3. 如申請專利範圍第2項所述之電連接器，其中連接器本體之側壁分為分為橫向之前壁、後壁，及縱長向之左壁、右壁，於前壁兩端延設有兩支撐塊。
4. 如申請專利範圍第3項所述之電連接器，其中連接器本體之一端開設有作動腔，該作動腔係貫穿連接器本體。
5. 如申請專利範圍第4項所述之電連接器，其中壓板係為一中空框體構造。
6. 如申請專利範圍第5項所述之電連接器，其中連接器本體另一端對稱開設有定位槽，於靠近定位槽之後壁之中部開設有缺口，壓板於連接器本體定位槽之相應位

#### 六、申請專利範圍

置延設有扣持部，壓板於兩扣持部之間對應缺口位置延設有定位部。

7. 如申請專利範圍第6項所述之電連接器，其中壓板一端彎曲延伸有配合部，該配合部係容置於連接器本體之作動腔。
8. 如申請專利範圍第7項所述之電連接器，其中壓板之扣持部係定位於連接器本體之定位槽，壓板之定位部係扣持於連接器本體之缺口。
9. 如申請專利範圍第8項所述之電連接器，其中壓板之兩相對側邊於中部向連接器本體方向鼓起，形成夾持部。
10. 如申請專利範圍第9項所述之電連接器，其中撥動件之作動部上彎折鼓出一鎖固部，該鎖固部可抵接於壓板之配合部上。
11. 如申請專利範圍第10項所述之電連接器，其中加強片之擋板係定位於連接器本體兩支撐塊之間且與連接器本體間形成一間隙，撥動件係放置於連接器本體之兩支撐塊上。
12. 如申請專利範圍第11項所述之電連接器，其中加強片係為金屬材質。
13. 一種用於將平面柵格陣列封裝與電路板電性連接的電連接器，其包括：  
連接器本體，其設有容置有複數導電端子之導電區及其周圍設置之複數容置槽；

#### 六、申請專利範圍

壓板及撥動件，係組接於連接器本體以固持平面柵格陣列封裝；

加強片，係組接於連接器本體上，其中撥動件包括驅動部及與其相連設置之作動部，加強片係為一中空框體構造，並於連接器本體容置槽之相應位置向連接器本體方向延伸有複數折片，加強片一端向連接器本體延設有擋板，撥動件之作動部係可容置於擋板與連接器本體一側壁間而防止作動部脫離連接器本體。

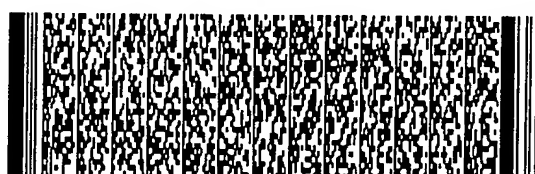
14. 如申請專利範圍第13項所述之電連接器，其中連接器本體之側壁分為分為橫向之前壁、後壁，及縱長向之左壁、右壁，於前壁兩端延設有兩支撐塊。

15. 如申請專利範圍第14項所述之電連接器，其中連接器本體之一端開設有作動腔，該作動腔係貫穿連接器本體。

16. 如申請專利範圍第15項所述之電連接器，其中壓板係為一中空框體構造。

17. 如申請專利範圍第16項所述之電連接器，其中連接器本體另一端對稱開設有定位槽，於靠近定位槽之後壁之中部開設有缺口，壓板於連接器本體定位槽之相應位置延設有扣持部，壓板於兩扣持部之間對應缺口位置延設有定位部。

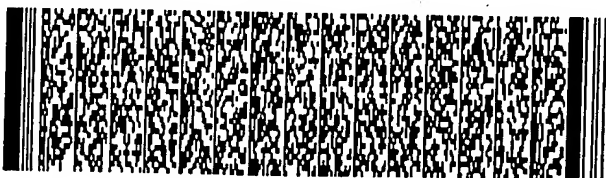
18. 如申請專利範圍第17項所述之電連接器，其中壓板另外邊沿弧線彎曲延伸有配合部，該配合部係容置於連



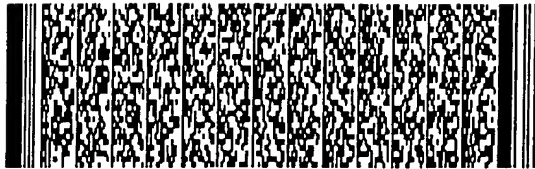
六、申請專利範圍

接器本體之作動腔。

19. 如申請專利範圍第18項所述之電連接器，其中壓板之扣持部係定位於連接器本體之定位槽，壓板之定位部係扣持於連接器本體之缺口。
20. 如申請專利範圍第19項所述之電連接器，其中壓板之兩相對側邊於中部向連接器本體方向鼓起，形成夾持部。
21. 申請專利範圍第20項所述之電連接器，其中其中撥動件之作動部上彎折鼓出一鎖固部，該鎖固部可抵接於壓板之配合部上。
22. 如申請專利範圍第21項所述之電連接器，其中加強片之擋板係定位於連接器本體兩支撐塊之間且與連接器本體間形成一間隙，撥動件係放置於連接器本體之兩支撐塊上。
23. 如申請專利範圍第22項所述之電連接器，其中加強片係為金屬材質。



第 1/16 頁



第 2/16 頁



第 2/16 頁



第 3/16 頁



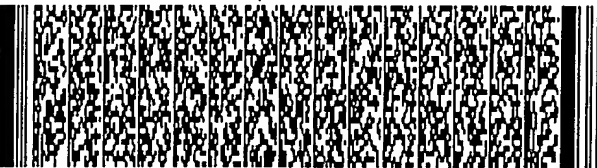
第 4/16 頁



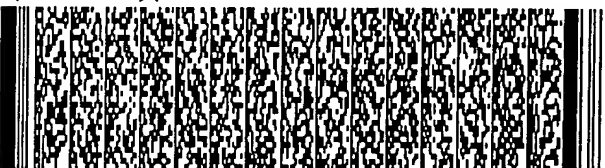
第 6/16 頁



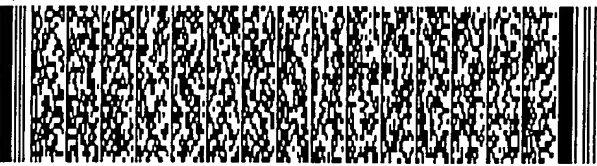
第 6/16 頁



第 7/16 頁



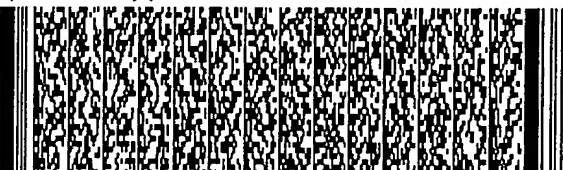
第 7/16 頁



第 8/16 頁



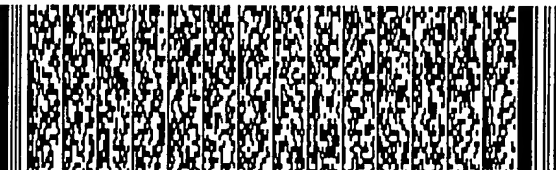
第 8/16 頁



第 9/16 頁



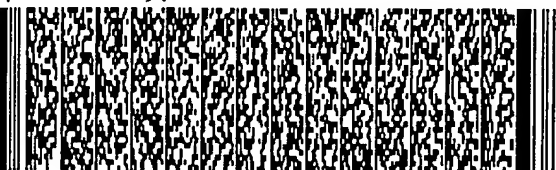
第 9/16 頁



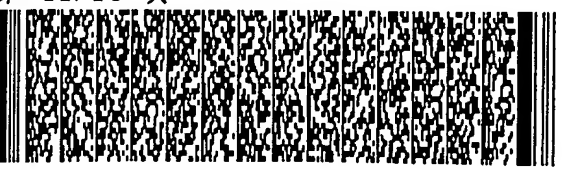
第 10/16 頁



第 10/16 頁



第 11/16 頁

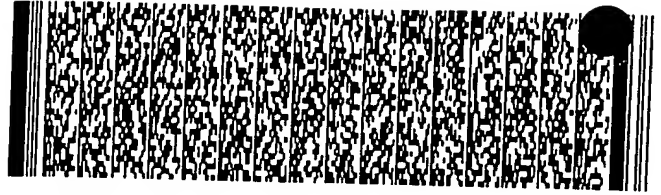




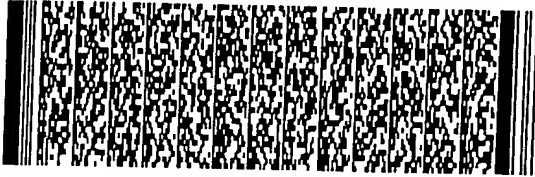
第 11/16 頁



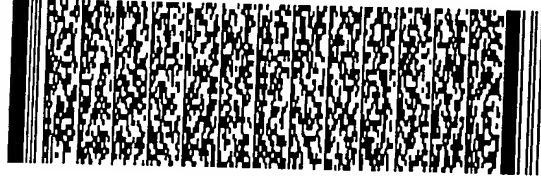
第 12/16 頁



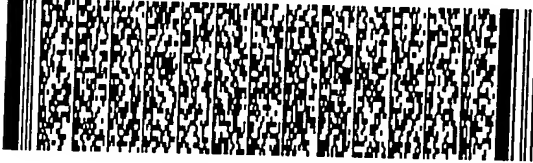
第 13/16 頁



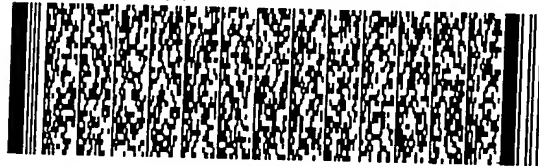
第 13/16 頁



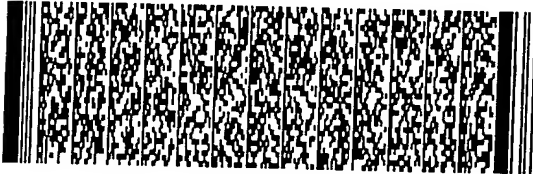
第 14/16 頁



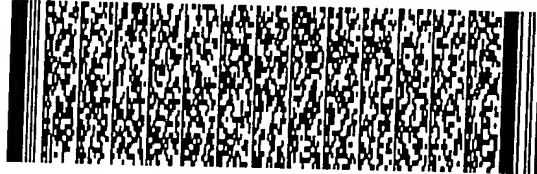
第 14/16 頁



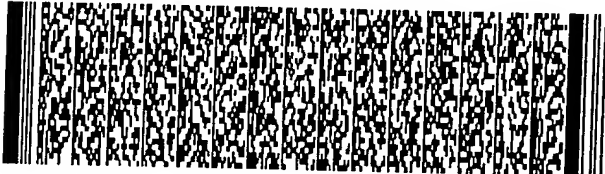
第 15/16 頁

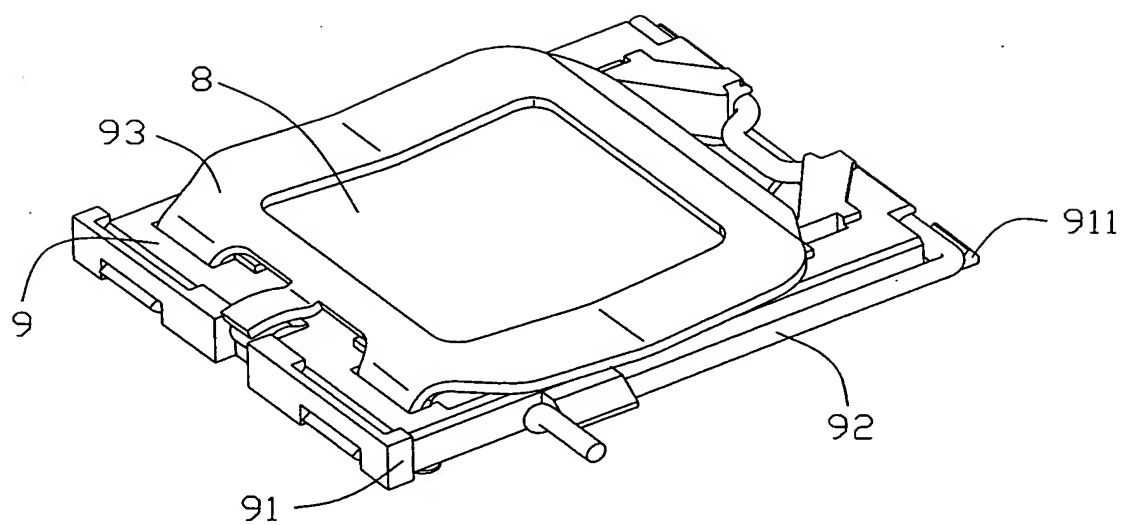


第 15/16 頁

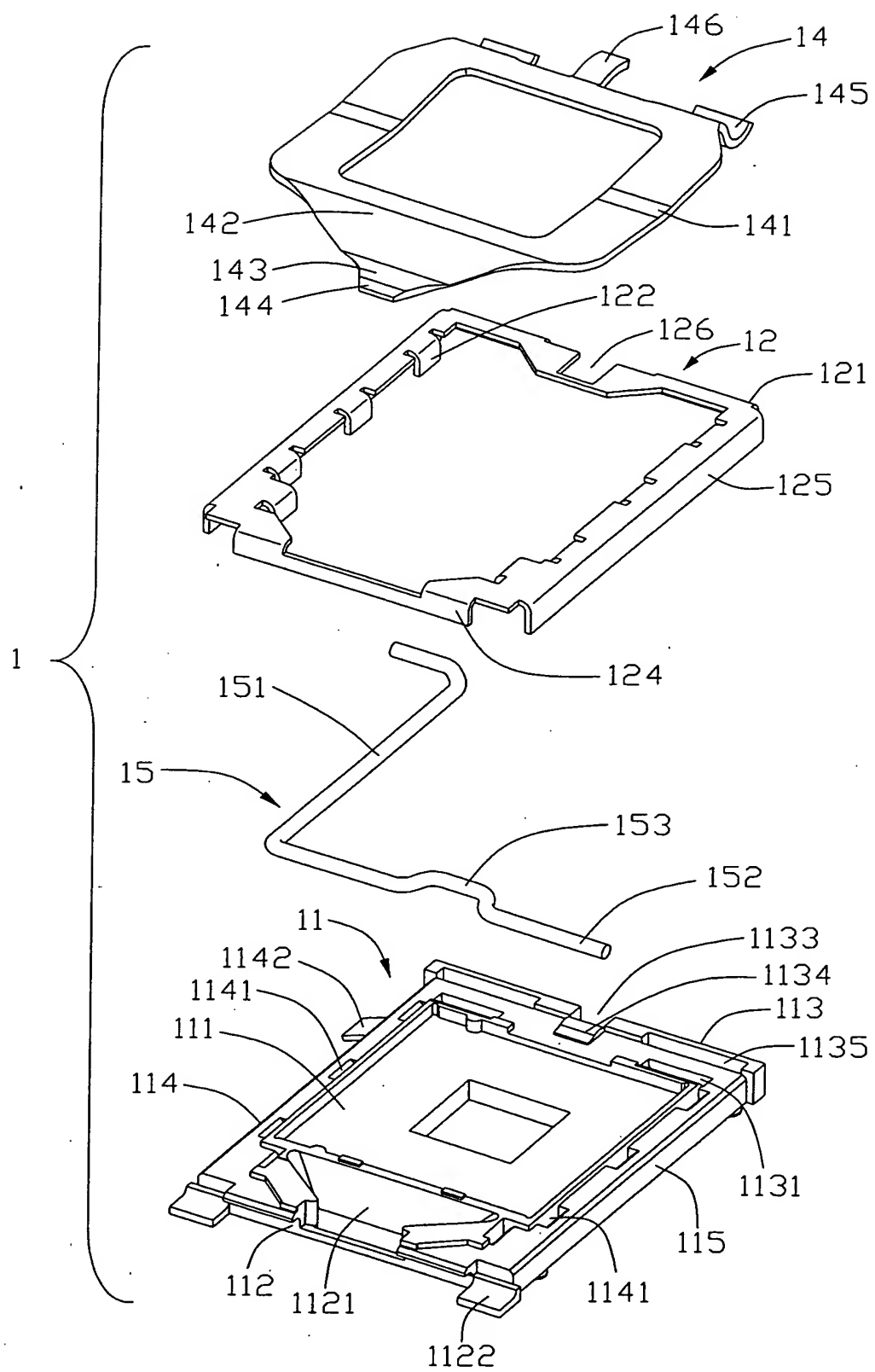


第 16/16 頁

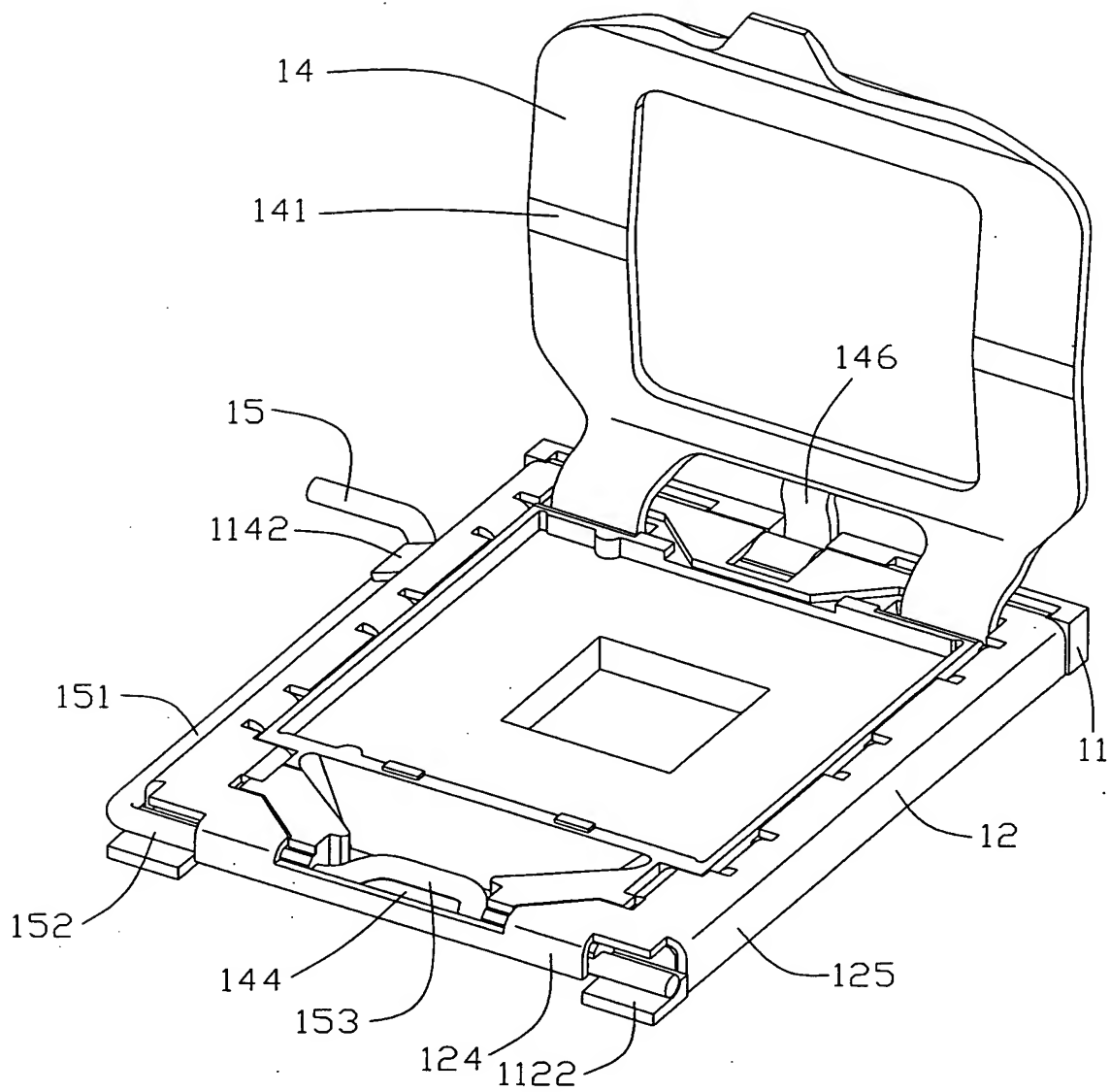




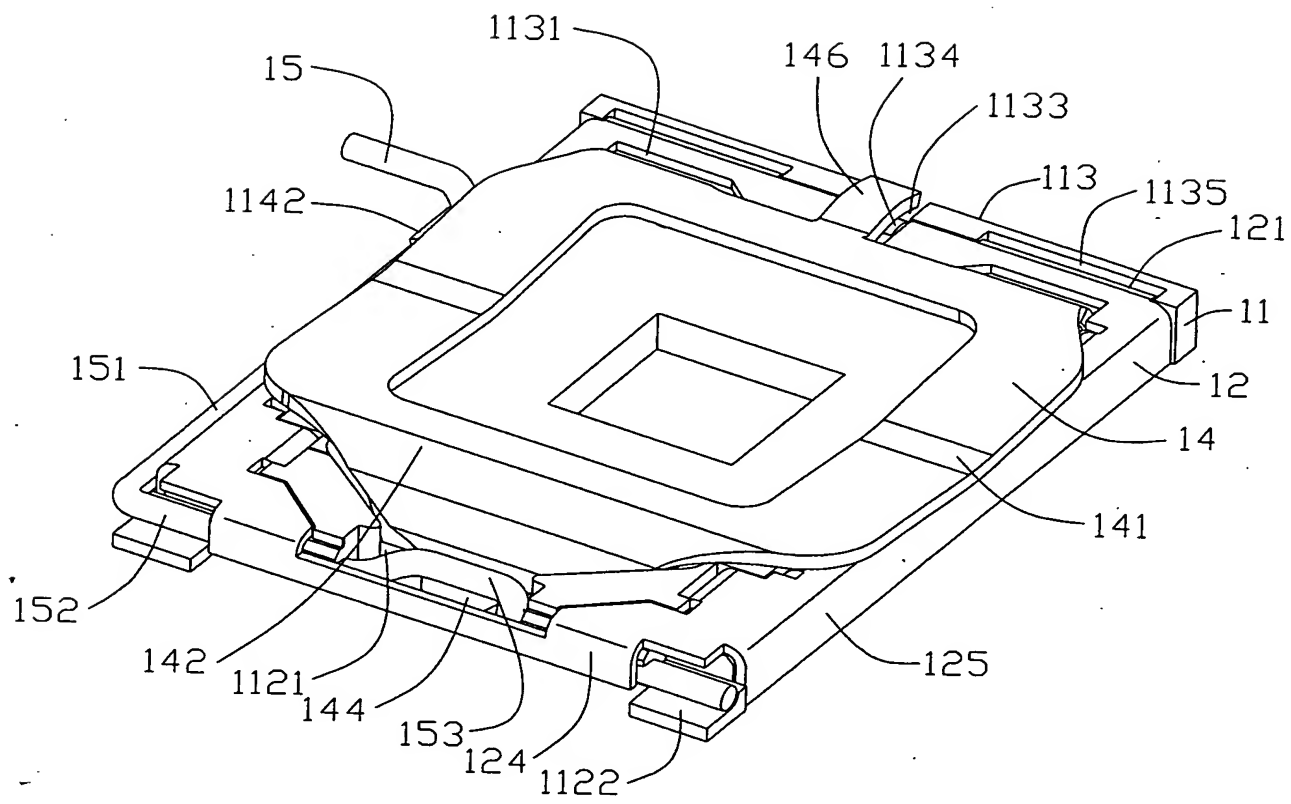
第一圖



第二圖



第三圖



第四圖